

Claims

What is claimed is:

1. A punch for punching a workpiece, the punch comprising:
a four-bar linkage including at least four members, at least one of the members movable upon actuation of the linkage;
a support member defining one of the at least four members and configured to locate and accommodate the workpiece in a punching position; and
at least two punch elements configured to punch at least two holes in the workpiece upon actuation of the linkage, wherein the at least two punch elements are movable upon actuation of the linkage.
2. The punch of claim 1, wherein at least one of the members of the four-bar linkage is movable in a first plane and the punch elements are movable within a second plane, the first plane being substantially perpendicular to the second plane.
3. The punch of claim 2, wherein the linkage is manually operable.
4. The punch of claim 3, wherein the linkage includes a manually actuating operable actuating member movable substantially parallel to the first plane.
5. The punch of claim 1, wherein the support member is configured to receive the workpiece at an upright angle for punching.
6. The punch of claim 5, wherein the upright angle is less than about 40 degrees from a vertical.

7. The punch of claim 6, wherein the upright angle is less than about 25 degrees from a vertical.

8. A punch for punching at least one sheet of paper, the punch comprising:
a base;
a support portion including an arcuate portion configured to support a first surface of the at least one sheet of paper in an arcuate punching position; and
at least one punch mechanism operably associated with the support portion to punch at least one hole in the at least one sheet of paper upon actuation of the punch.

9. The punch of claim 8, wherein the support portion is oriented upright to allow gravity to assist positioning the paper against the support portion.

10. The punch of claim 9, wherein the support portion is oriented at an angle to a vertical.

11. The punch of claim 10, wherein the angle is less than about 40 degrees from the vertical.

12. The punch of claim 11, wherein the angle is less than about 25 degrees from the vertical.

13. The punch of claim 8, wherein more than one-third of the support portion is arcuate.

14. A punch for punching a workpiece, the punch comprising:
a four bar linkage including at least four members; and
at least one punch element operably associated with a first member of the linkage
wherein, upon actuation of the linkage, an arcuate motion of the first member of the linkage
drives the punch element to punch a hole in the workpiece.
15. The punch of claim 14, wherein upon actuation of the linkage, the first
member of the linkage abuts the at least one punch element.
16. The punch of claim 14, wherein a second member of the linkage is configured
to support the remaining members of the linkage and the at least one punch element.
17. The punch of claim 14, wherein the first member of the linkage operates the at
least one punch element by imparting a camming action upon the at least one punch element.
18. The punch of claim 14, wherein one of the at least four members includes a
support member to accommodate and locate the workpiece in an upright punching position.
19. The punch of claim 18, wherein the support member is oriented at an angle
from a vertical, the angle being less than about 40 degrees.
20. The punch of claim 19, wherein the angle is less than about 25 degrees from
the vertical.

21. The punch of claim 14, wherein the linkage is actuated upon a motion of a third member of the linkage, the first and third members of the linkage being pivotably associated.

22. A punch for punching a workpiece, the punch comprising:
a four-bar linkage including a support member configured to locate and accommodate the workpiece in an upright punching position; and
at least one punch element operably associated with the support member;
wherein an actuation motion of the linkage operates the at least one punch element to punch at least one hole in the workpiece.

23. The punch of claim 22, wherein a first member of the linkage includes a base.

24. The punch of claim 22, wherein a second member of the linkage includes the support member.

25. The punch of claim 22, wherein the four-bar linkage includes at least four pivots defining therebetween a quadrilateral having at least two opposed, non-parallel sides.

26. The punch of claim 25, wherein the at least two opposed, non-parallel sides include first and second pairs of opposed, non-parallel sides.

27. The punch of claim 22, further comprising an actuating portion configured for manual operation and mechanically operatively connected to the support member and the punch element for manually imparting said actuation motion.

28. The punch of claim 22, wherein the support member is oriented at an angle from a vertical, the angle being less than about 40 degrees.

29. The punch of claim 28, wherein the angle is less than about 25 degrees from the vertical.

30. A punch comprising:
- a base;
 - a support member pivotally coupled to the base and configured to support a sheet of paper;
 - a punch mechanism positioned to punch the sheet of paper;
 - a drive member pivotally coupled to the base; and
 - an actuating member pivotally coupled to the support member and pivotally coupled to the drive member, the actuating member movable between a first position and a second position such that when in the second position the drive member engages the punch mechanism to punch the sheet of paper.
31. The punch of claim 30, wherein the base defines a first pivot axis and a second pivot axis spaced a distance from and substantially parallel to the first pivot axis.
32. The punch of claim 31, wherein the support member pivots about the first pivot axis and the drive member pivots about the second pivot axis.
33. The punch mechanism of claim 30, wherein the paper tray supports the paper in a generally upright position.
34. The punch of claim 30, wherein the punch mechanism includes a punch pin movable relative to the support member.

35. The punch of claim 34, wherein the drive member engages the punch pin to translate the punch pin along a punch path that is substantially perpendicular to the sheet of paper.

36. The punch of claim 30, further comprising a plurality of punch mechanisms, each movable to punch the sheet of paper.

37. The punch of claim 30, wherein the base, the support member, the drive member, and the actuating member together define a four-bar linkage.

38. The punch of claim 30, further comprising a paper tray supported by the support member and operable to support the sheet of paper in a punch position.

39. The punch of claim 30, wherein the punch mechanism is supported by the support member.

40. A method of punching a hole in a sheet of paper, the method comprising:
supporting the sheet of paper in a punch position adjacent a punch mechanism;
positioning a drive member in a drive position such that it is engageable with
the punch mechanism; and
moving an actuator to move the drive member toward the sheet of paper and to
move the sheet of paper toward the drive member.

41. The method of claim 40, wherein the moving step includes pivoting the drive
member toward the sheet of paper and pivoting the sheet of paper toward the drive member.

42. The method of claim 40, further comprising translating a portion of the punch
mechanism in a direction substantially perpendicular to the sheet of paper.

43. The method of claim 40, wherein the moving step further comprises moving
the punch mechanism toward the drive member.